

1 **NESTABLE DISPLAY CRATE FOR BOTTLE CARRIERS**

2 **REFERENCE TO RELATED APPLICATIONS**

3 This application is a continuation-in-part of applications Serial No. 08/423,347, filed April
4 18, 1995, and Serial No. (TBA), filed May 15, 1997, which are incorporated herein by reference.

5 **BACKGROUND OF THE INVENTION**

6 The present invention relates to a nestable display crate for transporting and storing bottle
7 carriers, more particularly, the present invention relates to crates that combine nestability and high
8 strength with high visibility for multi-packs of bottles.

9 Bottles, particularly for soft drinks and other beverages, are often stored and transported
10 during the distribution stages thereof in crates or trays. The term "crate" or "tray" as used herein
11 includes crates, trays and similar containers having a floor bottom and peripheral sidewall
12 structure. These crates generally are configured to be stacked on top of each other when loaded
13 with bottles, and nested together when empty of bottles. The plastic crates provide advantages
14 such as conservation of storage space and efficient, easy handling and recyclability. In order to
15 minimize the storage space of the crates when nested and to reduce cost and weight, many crates
16 today are made with a shallow peripheral sidewall structure. These generally are referred to as
17 "low depth" crates in which the bottles bear most of the load of above-stacked crates. Crates
18 having a higher peripheral sidewall, approximately the same height as the bottles generally are
19 referred to as "full depth" crates in which the crates themselves bear most of the load of above-
20 stacked crates.

21 Low depth crates are generally less expensive and lighter in weight than full depth crates.
22 Thus, low depth crates are used extensively. Generally, it is desirable to design low depth crates
23 with a wall structure that provides lateral support for the bottles while also allowing the bottles
24 to be visible.

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2 to be visible.

3 An example of a known low depth bottle crate for bottles of single serve capacity is
4 disclosed in commonly assigned U.S. Patent No. 5,060,819, the disclosure of which is also hereby
5 incorporated by reference in its entirety. The bottle crate of the '819 patent has a sidewall
6 structure with upright adjacent panels, alternating ones of which are raised such that their lower
7 surfaces are spaced above the floor. The top and bottom edges of the sidewall thereby have an
8 undulating configuration such that empty trays can nest together.

9 Crates for single serve bottles are customarily stacked on top of each other. One way of
10 handling the loaded crates is to stack the cases on pallets which can be lifted and moved about by
11 fork-lift trucks. A technique for interconnecting loaded crates is called cross-stacking, and is
12 often used to improve stability of a stack of crates for transport or for display purposes by a
13 retailer. An aspect of crate design is to provide the structural features which facilitate handling
14 of stacked and cross-stacked loaded crates to enhance the stability of stacked crates, while
15 providing maximum visibility of the bottles or bottle carrier, especially in a retail setting.

16 One of the problems associated with previous nestable crates, particularly, those for single
17 serve bottles, has been lack of strength when used in some settings. The tray of the '819 patent,
18 for instance, has a sidewall which may not stand up to very rough handling over time.
19 Accordingly there has been a need for reusable nestable crates having the requisite strength and
20 rigidity to withstand repeated or rough handling.

21 Another problem experienced with previous nestable crates has been somewhat limited
22 visibility of the bottle or container labels. Although the sidewall of the tray in the '819 patent
23 does allow for some of the bottle labels to be displayed, the wall obstructs the view of the
24 containers to some degree. The obscured visibility problem has been more pronounced when the
25 bottles are grouped together in a cardboard carrier or otherwise bundled because present crates
26 are not designed to show the labels on the carriers or shrink wrap. There is a need for a nestable
27 display crate which has improved and structural strength and provides bottle carrier visibility.

28 **SUMMARY OF THE INVENTION**

29 Accordingly, it is a principal object of the present invention to provide a low depth display
30 crate for bottle carriers or multi-packs which is nestable with other similar crates when empty to

1 conserve space, and which is stackable and cross-stackable with other similar crates when loaded
2 with bottles for storing, displaying and transporting the multi-packs.

3 Another object of the present invention is to provide a low depth, nestable crate which has
4 sufficient structural strength to withstand repeated and rough handling.

5 Another object of the present invention is to provide a sturdy low depth, nestable crate
6 which also provides maximum visibility of the bottle carriers for display purposes.

7 Still another object of the present invention is to provide a low depth, nestable crate which
8 makes efficient use of space both when loaded and stacked and when empty and nested. When
9 loaded and stacked, the present invention also has structural features which securely engage the
10 tops of variously sized bottle tops.

11 Directed to achieving these objects, a new low depth, nestable display crate for bottle
12 carriers is herein provided. The preferred configuration is for four six-pack carriers of bottles.
13 It will be understood that while the preferred embodiment of the present invention is configured
14 for retaining six-pack bottle carriers, the crate may be used to store or transport any type of
15 container and differently grouped multi-packs. This crate is formed by integrally molding from
16 plastic, two basic components -- a floor and a wall structure extending up from the floor and
17 extending around the periphery of the floor.

18 The wall structure comprises a wall of double thickness with a lower wall portion adjacent
19 the floor and a plurality of integrally formed contoured upper wall portions extending upward
20 from the lower wall portion. The wall structure is hollow throughout allowing the contoured
21 upper wall portions to be received within the lower wall portion of a crate nested thereabove.
22 The contoured upper wall portions are tapered to be smaller in cross section at the top and larger
23 near the lower wall portion to enable easy nesting and to avoid nested crates from becoming
24 wedged together due to interference.

25 The contoured upper wall portions are preferably arranged along the opposing sidewalls
26 of the crate and the endwalls. The upper wall portions along the sidewalls are positioned so that
27 they are between six-pack carriers when the crate is loaded, and the space in between the upper
28 wall portions is a window that allows for a bottle carrier to be visible. The endwalls of the crate
29 comprise integrally molded handles which are configured to allow for palm-up or palm-down
30 gripping. The crate of the present invention combines the advantages of a nesting crate with

1 sufficient strength afforded by its double-walled construction with maximum, unobstructed
2 visibility of bottle carriers.

3 The floor preferably has an open lattice design which not only allows unwanted fluids to
4 drain out of the crate, but also requires less material and thus is lighter than a solid floor design.
5 The floor also has bottle carrier support areas, preferably in an array.

6 The floor of the crate has an outer or bottom surface which is configured for
7 accommodating the tops of bottles in a similar crate underneath. The floor bottom surface
8 preferably has upwardly recessed receiving areas disposed to receive the tops of bottles contained
9 in a similar crate therebeneath. The bottle top receiving areas aid in retaining the bottles vertically
10 upright which enhances the stability of stacked loaded crates.

11 These and other features and advantages of the invention may be more completely
12 understood from the following detailed description of the preferred embodiments of the invention
13 with reference to the accompanying drawings.

14 **BRIEF DESCRIPTION OF THE DRAWINGS**

15 FIG. 1 is a top perspective view of a crate in accordance with the present invention;

16 FIG. 2 is a bottom perspective view of the crate of FIG. 1;

17 FIG. 3 is an elevational view of a sidewall of the crate of FIG. 1;

18 FIG. 4 is an elevational view of an endwall of the crate of FIG. 1;

19 FIG. 5 is a top plan view of the crate of FIG. 1;

20 FIG. 6 is a bottom plan view of the crate of FIG. 1;

21 FIG. 7 is a side elevational view of the crate of FIG. 1 shown loaded with six-pack carriers
22 of bottles;

23 FIG. 8 is a cross-sectional view of the crate taken along line 8-8 of FIG. 5;

24 FIG. 9 is a cross-sectional view of the crate taken along line 9-9 of FIG. 5;

25 FIG. 10 is a cross-sectional view of the crate taken along line 10-10 of FIG. 5;

26 FIG. 11 is a cross-sectional view of the crate taken along line 11-11 of FIG. 5; and

27 FIG. 12 is a cross-sectional view of the crate taken along line 12-12 of FIG. 5.

28 **DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT**

29 Referring to FIGS. 1 and 2, crate 10 of the preferred embodiment comprises a wall
30 structure with a lower wall portion 12, an upper wall portion 14 and a floor 16. Crate 10 is

preferably rectangular and the wall structure comprises sidewalls and endwalls. Although a rectangular crate is shown and described, the present invention is not limited thereto and may comprise sidewalls and endwalls of equal length resulting in a square crate.

The wall structure is of double-thickness and defines the periphery of crate 10 with opposing sidewalls and opposing end walls. Lower wall portion 12 includes a plurality of interior panels 18 which are connected to floor 16, and an exterior surface 20 which forms an uninterrupted band along each of the sidewalls. Upper wall portion 14 comprises a plurality of trapezoid or rectangular shaped sidewall teeth 22 resembling gear teeth spaced along the sidewall, FIG. 3. Two endwall teeth 24 on each of the endwalls provide the supports for a handle 26, FIG. 4.

The exterior surfaces of the lower wall portion and teeth of the upper wall portion are integral and include a contoured step 28 where the teeth are inwardly directed and extend above the lower wall portion. Step 28 is integral with top surfaces 30 of the lower wall portion that are arranged between teeth. Step 28 and top surfaces 30 form a shoulder which generally defines the portion of a crate that will be visible when crates are nested together. At the endwalls, handle 26 is supported on teeth 24 and protrudes outward slightly so that the exterior surface of handle 26 is flush with the lower wall portion.

As best seen in FIGS. 1 and 8-11, the interior surfaces of the wall structure include interior teeth panels 32 which are connected to interior lower panels 18 of the lower wall portions. Interior teeth panels 32 provide upper lateral supports for bottle carriers, and interior lower panels 18 provide lower lateral supports for the bottle carriers. Interior lower panels 18 are arranged along the periphery of the floor and alternate with cut-outs 34 which reduce the amount of material making the crate lighter in weight. Since the interior panels 18 are connected to the floor, free edges of the floor extend across cut-outs 34 in between panels 18. Viewed from the inside of the crate, these panels are arranged in alternating zig-zag fashion. The surfaces of these panels are flat to support the flat cardboard walls of carriers loaded with bottles.

The exterior surface of lower wall portion 12 has a central flat label portion 36 which can be used for molded in information, logos, advertisements and the like.

Teeth 22 and 24 are provided with internal ribs 23 and 25 respectively which bear against the tops of corresponding teeth in a similar crate when the crates are nested together. These

1 nesting supports ensure that the weight of a column of nested crates is borne by sufficiently strong
2 elements of the crate to provide stability and ensure that the wall structures do not fray from
3 repeated use. These internal ribs 23 and 25 are integrally formed in the hollow spaces inside teeth
4 22 and 24. Ribs 23 and 25 are shown in FIG. 6 and in cross-section in FIGS. 8 and 9. Ribs 23
5 and 25 preferably are located in the upper part of teeth 22 and 24, and hidden from view by the
6 interior and exterior surfaces of the teeth. FIG. 6 best illustrates how ribs 23 and span the inside
7 of teeth 22 and 24, bridging their interior and exterior surfaces.

8 In the preferred embodiment of crate 10, teeth 22 along the sidewalls are specifically
9 configured to provide openings that make the labels of cardboard bottle carrier visible. This is
10 best seen in FIG. 7 which illustrates cardboard carriers C loaded with bottles B with the having
11 a label L on their long sides. Labels L are visible through the openings defined between teeth 22
12 due to the configuration of teeth 22. This visibility is important in a retail setting for identification
13 and aesthetic purposes. For maximum exposure of labels L while providing sufficient support to
14 the carriers, the center tooth is slightly larger to support portions of both carriers.

15 Handles 26 on the endwalls of crate 10 are integrally molded with the lower wall portion
16 but extend upward so that the tops of the handles are flush with the tops of endwall teeth 24.
17 Relatively large handle cut-outs 38 are provided to the outside so handles 26 are bar-like in
18 construction in that there is complete clearance both above and below the handles for a user's
19 hands to grasp the crate in either the palm-up or palm-down positions. Also, since the handles
20 are spaced slightly outwardly from endwall teeth 24, more space is provided between the bottle
21 carriers loaded in the crate and the handles.

22 In handling a loaded crate, the palm-up position refers to the position of a user's hands
23 when the fingers are inserted below handle 26 from the outside of the crate such that the palms
24 generally face up and inward. The palm-down position refers to the position of a user's hands
25 when the fingers are inserted below handle 26 from the inside of the crate such that the backs of
26 the hands are facing each other and the palms are generally facing down and/or outward. The
27 height of handles 26 and their length, ensure that a user's hands have sufficient clearance to grasp
28 the handle in either the palm-up or palm-down positions. Providing a user with the option of
29 handling the crate in either hand position helps alleviate fatigue and prevent hand-wrist injuries
30 since a natural grasping motion can be used. The importance of this feature can be appreciated

1 when the crate is loaded with bottles. The handles on prior crates or trays may have been too
2 constricting on some user's hands, and may have required awkward and harmful hand/wrist
3 positions, particularly when lifting and handling heavy loaded crates.

4 Crate profile views, FIGS. 3 and 4 show that exterior of lower wall portion 12 is
5 preferably not quite flush with the floor bottom surface so that the floor bottom surface is left
6 exposed somewhat in profile. Leaving lower wall portion 12 slightly higher than the floor bottom
7 surface facilitates handling by allowing hand trucks to slide easily under the crate, and prevents
8 the exterior lower wall portion from fraying and catching on bottle tops in stacked columns of
9 crates.

10 The crate of the present invention combines the features of nestability, strength and
11 visibility. In constructing the crate, many design parameters must be determined with the goal of
12 enhancing the above mentioned characteristics without unduly sacrificing any of them. Visibility
13 is important both for permitting attractive display of the carriers, and the present invention
14 provides maximum visibility for its size without sacrificing strength and nestability.

15 Floor 16 preferably has a lattice-like configuration having a pattern of open spaces as best
16 seen in FIGS. 3, 5 and 6. The floor comprises a system of grid-like longitudinal and lateral struts
17 traversing the floor in perpendicular relation to one another and connecting circular lattice
18 elements together. A plurality of circular lattice elements define the locations of bottle tops in a
19 loaded crate stacked therebeneath, and curved lattice members generally surround the circular
20 elements to define bottle top location areas. Interstitial circular members are provided between
21 bottle tops areas as well. The open floor design provides a light weight crate, and is practical for
22 allowing any liquids to drain through floor 16. The floor is generally flat and open so as not to
23 interfere with the bottle carriers.

24 Floor 16 has an upper or top surface 40 which is generally flat and includes a plurality of
25 support areas for supporting bottle carriers thereon. Arranged along the sidewalls and endwalls
26 adjacent interior panels 18, are solid floor surfaces 42 which ensure that a strong connection
27 between the wall structure and floor.

28 The support areas are arranged in rows and columns to thereby define an array. In the
29 preferred embodiment, crate 10 is designed to hold four six-packs of bottles in cardboard carriers.
30 The support areas are configured so that bottles in an array are retained in relatively close relation

1 so as to prevent jostling of the bottles during handling. Excess movement of the bottles is to be
2 avoided in order to ensure that the bottles remain in a vertically upright position to most
3 advantageously bear the load of bottles stacked or cross-stacked thereabove.

4 Floor 16 has a bottom surface 44 which has distinctive structural features. Floor bottom
5 surface 44 is configured to allow for stacking and cross-stacking of loaded crates. Cross-stacking
6 is done by rotating a top crate 90 degrees about a vertical axis and lowering onto a bottom crate
7 or crates. During shipping and handling crates may be moved by machines and it is advantageous
8 to use crates which can be stably stacked or cross-stacked. Additionally, when the crates are used
9 to display the containers in a retail setting, the retailer may wish to cross-stack the crates for
10 display or space reasons.

11 Floor bottom surface 44 has a plurality of bottle top location areas defined by curved
12 lattice elements 46, best seen in FIGS. 2 and 6. The positions of curved lattice elements 46 are
13 determined to provide a range within which the bottle tops in a loaded crate therebeneath may
14 reside and still provide safe stacking and cross-stacking. The bottoms of curved lattice elements
15 46 extend downward slightly from the bottom of the rest of the floor bottom surface. The
16 receiving areas help retain bottles in vertically upright positions to bear the load of bottles stacked
17 or cross-stacked thereabove.

18 From the foregoing detailed description, it will be evident that there are a number of
19 changes, adaptations, and modifications of the present invention which come within the province
20 of those skilled in the art. However, it is intended that all such variations not departing from the
21 spirit of the invention be considered as within the scope thereof as limited solely only by the claims
22 appended hereto.